Reports Nos. VKYTRC/005, 006 & 007/KK/81

Integrated Approach of Yoga Therapy In The Treatment of Diabetes Mellitus, Hypertension & I.H.D.

by

Dr. R. NAGARATHNA & Dr. H. R. NAGENDRA

January 1981

Published by :

Vivekananda Kendra Yoga Therapy & Research Centre
Vivekanandapuram : : Kanyakumari 629 702.

CONTENTS

		Page No.
REPORT No. VKYTRC / 005 / KK / 1981		
Investigations on the use of Integrated Approach of Yoga Therapy for Diabetes Mellitus		
1. Introduction	....	1
2. Understanding Diabetes Mellitus	....	2
2.1. Clinical Feature	....	2
2.2. Presentation	....	3
2.3. Anatomy and Physiology	....	3
2.4. Chemical Pathology	....	5
2.5. Pathology	....	6
2.6. Actiology	....	6
3. Managing the Diabetes Mellitus	....	7
3.1. Diet	....	8
3.2. Oral Hypoglycaemic drugs	....	8
3.3. Insulin	....	9
3.4. Hypoglycaemia	....	9
4. Yoga Therapy in the management of D.M.	....	9
4.1. Yoga Therapy Principles	....	9
4.2. Yoga Therapy and D.M.	....	10
4.3. Working at the Annamaya Kosa level	....	10
4.4. Operations at Pranamaya Kosa level	....	11
4.5. Manomaya operations	....	11
5. Patients and Methods	....	11
6. Results and Discussions	....	12
Table 2 : Statistical analysis of data on DM	....	12
Table 3 : Weight reduction in two types of DM	....	13
Table 4 : Reduction in PPBS in cases	....	13
7. Summary and Conclusions	....	14
References	....	14
Basic data of diabetes Mellitus Table	....	15

Report No. VKYTRC / 005 / KK / 1981

Investigations on the use of Integrated Approach of Yoga Therapy for Diabetes Mellitus

by

R. NAGARATHNA* & Dr. H. R. NAGENDRA**

ABSTRACT: Fortynine patients suffering from Diabetes Mellitus have been treated by using the integrated approach of Yogic practices. After presenting briefly the modern medical understanding and management of this clinical syndrome characterised by hyperglycaemia, the principles of Yoga therapy applied to Diabetes Mellitus are described. The results analysed by the Students paired 't' test show significant improvement in Blood Sugar chemistry and weight. Out of the 22 cases with PPBS (2 hr.) greater than 180, 19 have shown improvement and in 3 patients PPBS has slightly increased. Eleven out of the 19 cases have shown PPBS value reduced below 180.

There has been a significant decrease in weight in both the Juvenile and mature onset groups. Even in cases where there was no change in weight, there was a significant reduction in PPBS indicating that the improvements are not due to weight reduction but probably due to the relaxation erasing the stress factor.

The results indicate a distinct possibility of using the integrated approach in the rehabilitation of Diabetics.

1. INTRODUCTION

Man's quest for happiness has continued from times immemorial. The modern era of science and technology featured by increased standards of living with large number of comfort objects has made man exert less for his living. Lack of physical activity and sedantry habits coupled with stressful living have created modern ailments of the psychosomatic type. Hypertension, cardiac diseases, Asthma, Diabetes Mellitus etc. belong to this category.

* Chief Consultant,
Vivekananda Kendra

** Secretary, Yoga Shiksha Vibhag
Vivekananda Kendra

Though Diabetes mellitus has been in existence for centuries throughout the world, its incidence in the highly civilized societies of the present era is higher than it has ever been in the past. Today the modern medical world [4,7*] holds that there is no positive system of cure for Diabetes Mellitus; so is the belief regarding bronchial asthma, hypertension etc.

Varandani [9] and coworkers have investigated 286 patients in the age group 14–68 yrs with diabetes mellitus of mild (30%), moderate (40%) and severe (30%) types, using Kriyās and Asanās daily 2 hrs. in morning and 2 hrs. in the evening for 3 months. The results show that 25% of the cases reached normalcy without drugs; 27% improved in their blood and urine chemistry; 25% did not react (consisting of patients having Diabetes from their childhood and elderly persons unable to undergo the strenuous practices). The remaining 22% patients left the programme before 3 months. Some attempts to use TM in the rehabilitation of Juvenile diabetics are reported [2]. Fifteen cases of Diabetics in the age group 14 to 62 who underwent an integrated programme of Yoga therapy [5,6] for about a month showed signs of significant improvements as depicted by the students paired t–test of significance. The followup data for 3 months are also reported.

In this report is presented our further work on Diabetes Mellitus patients treated by 2 weeks nonresidential Yoga therapy programmes. In the next section a brief review of this endocrine disorder Diabetes mellitus (D.M.) as understood in modern medicine is presented. The next section delineates the Yoga therapy as applied to D.M. The last sections report our results and discussions.

2. UNDERSTANDING DIABETES MELLITUS

Diabetes Mellitus is a clinical syndrome characterised by hyperglycaemia, due to deficiency or diminished effectiveness of insulin [4]. The disease is chronic and effects the metabolism of carbohydrate, protein, fat, water and electrolytes, sometimes with grave consequences. The metabolic derangement is frequently associated with permanent and irreversible functional and structural changes in the cells of the body, those of the vascular system being particularly susceptible.

D.M. is the most common of the endocrine disorders. The prevelance in India is over 5 percent although more than half of those remain undetected.

2.1 Clinical Features :

There are two types of D.M.:

1. The Juvenile–onset type which developes during the first 40 years of life in patients of normal or less than normal weight. The majority develop severe symptoms of diabetes acutely, over a period of several weeks or months and if treatment with insulin is withheld they rapidly develop fatal ketoacidosis. Since administration of insulin is required for their survival, an alternative and preferable name for this group of patients is insulin–dependent (IDM).

2. The adult or maturity–onset type usually appears in middle aged or elderly patients who are often obese and in whom hyperglycaemia can usually be controlled by dietary means alone or, by an oral hypoglycaemic compound. For this reason it is sometimes described as the non insulin-independent type (NIDM). Insulin is

detectable in the plasma of nearly all patients in this category, and they are therefore less prone to develop ketosis. In this sense the disease is less severe than in the juvenile–onset type; however, the complications associated with long-term diabetes occur in both types.

Apart from the above two types of diabetes, two other categories are recognised.

(a) *Potential Diabetes:* Patients having increased liability to develop diabetes due to genetic reasons (eg. Children of two diabetic parents).

(b) *Latent Diabetes :* Patients who have shown an abnormal result under conditions imposing a burden on the pancreatic p Cells (eg. during pregnancy, infection or other severe stress etc.)

2.2 Presentation :

(a) Urine Sugar detection on routine checkup.

(b) Some or all of the classical symptoms of DM : thirst, polydipsia, tiredness, nocturia, loss of weight, white marks on clothing, pain in the limbs, impotence etc.

(c) A fulminating Ketoacidosis showing epigastric pain and vomiting occuring more likely in Juvenile–onset type. They are acute medical emergencies.

(d) Symptoms of complications of diabetes. Let us now try to understand the 'how' of DM.

2.3 Anatomy and Physiology :

The cells, the basic components of life need oxygen, proteins, fats, sugars, and salts for their life and growth. While O_2 is supplied by the respiratory system, it is the digestive system which is responsible for getting other nutritive material to them.

Fig. 1 (Page 4) shows a schematic of the digestive system. The digestive system is mainly a long continuous tube (nearly 30 ft in length) called alimentary canal through which the food passes. Most part of this tube is held in the abdomen. Nearly 9" long Oesophagus starts at the throat and ends in the stomach. The other hole of the stomach leads to small intestines. Liver, the biggest gland in the human body weighs nearly 55 Oz and is situated on the right side of the abdomen just below the diaphragm. Bile, stored up initially in gall bladder, is poured into the duodenum through the bile duct. Pancreas about 2 to 3 Ozs in weight is situated behind the stomach.

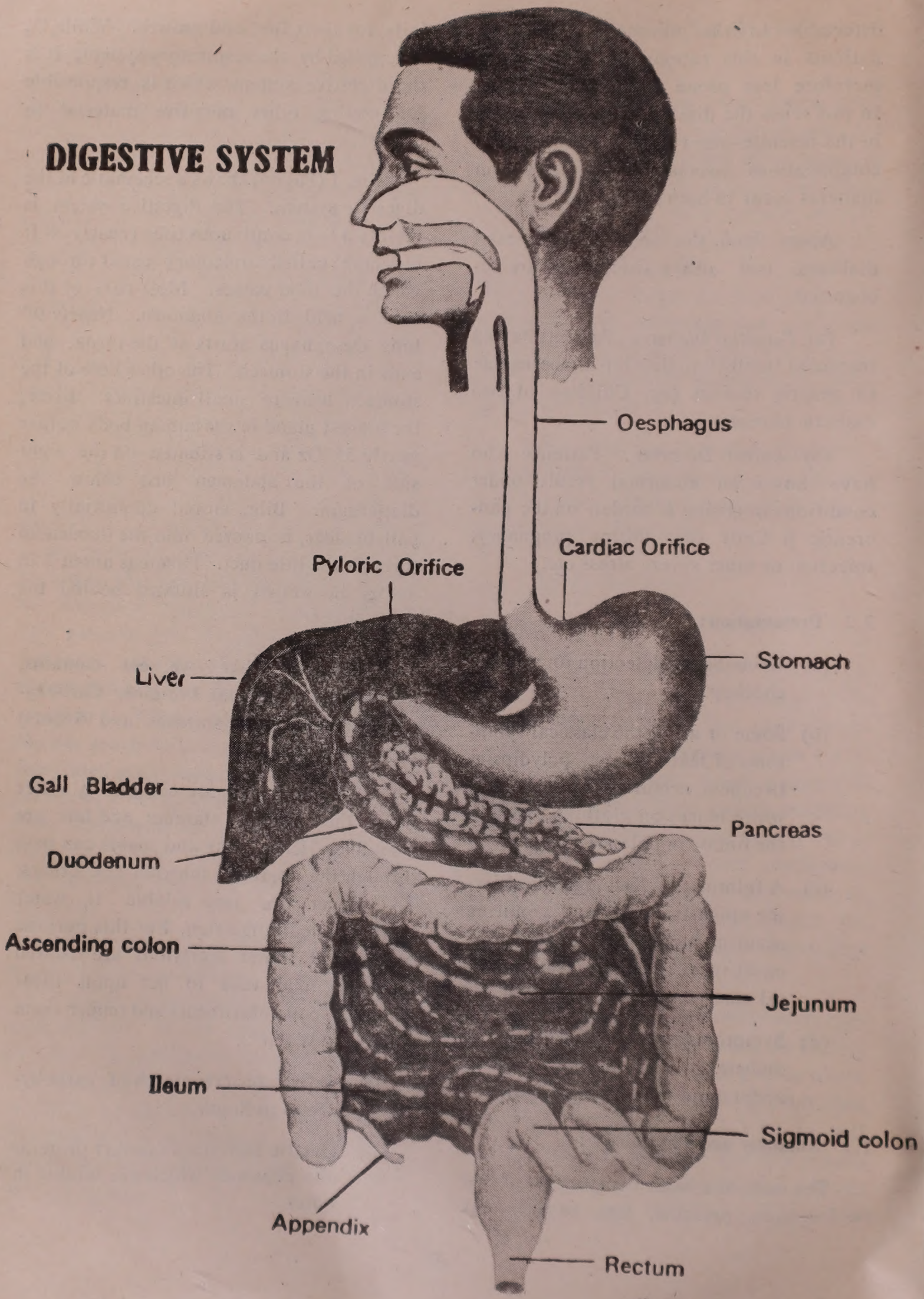
The food that we eat contains, (chemically examined) Proteins, Carbohydrates (containing starches and Sugars) Fats and Salts.

Salts and Sugars are soluble in water while the proteins, starches and fats are insoluble. Hence salts and sugars can pass through the digestive tube but not others. To render the rest soluble in water is what we call digestion. For this purpose different glandular secretions are poured into the food tube to act upon those insoluble food constituents and render them soluble in Water :

(i) Saliva converts starch of carbohydrates to Sugar.

(ii) Gastric secretions convert proteins into peptones which are soluble in water.

DIGESTIVE SYSTEM



(iii) Pancreatic juice acts on all starches, proteins and fats; but almost exclusively fats are digested by pancreatic juice.

These dissolved nutrients pass through the inner membrane and are carried away by the blood circulation through the capillaries. Thus food is digested and absorbed by the blood and assimilated by the cells of the body.

Sugar Metabolism :

The sugar taken by the blood stream will be in the from of glucose (mainly), fructose and galactose. They are either immediately used or stored in liver and muscles in the from of glycogen. It is the insulin secreted by the pancreas that pushes the glucose into skeletal muscles, fat cells and liver. Also the fat from the meals in the form of triglyceride is pushed into fat cells by insulin.

The blood sugar level is regulated continuously between 60 to 180 mgms/ml of blood. When the sugar level increases, as for example after meals, the P cells of the Islets of Langerhans (a group of endocrine gland cells in the Pancreas with the specific function of secreting harmones) secrete insuline to lower the sugar level. The opposite effect occurs when glucagon is secreted by the alpha Cells in the Islet. Thus the sugar level is maintained.

As the energy source for our body is through the following reaction :

$$\text{Glueose} + \text{Oxygen} \rightarrow\rightarrow CO_2 + H_2O + \text{High Energy phosphate Bonds} \downarrow \text{Energy}$$

Constant regulation of sugar level is very essential for the normal functioning of the human being.

DM, is a chronic imbalance in the mechanism regulating blood sugar level. It is characterised by hyperglycaemia (higher than 180 mgms/ml).

2.4 **Chemical Pathology :**

Although it has already been emphasised that diabetes is a clinical syndrome combining several different pathological processes in a common clinical picture, it can be asserted that in every case the hyperglycaemia results from the fact that the insulin secreted by the pancreas is either insufficient in amount or ineffective in action for one or more reasons. In any event increased gluconeogenesis and lipolysis will follow as compensatory reactions under the influence of such hormones as growth hormone and adrenocortical hormones, in what is basically a situation of glucose lack. Thus the hyperglycaemia characteristic of diabetes arises from two main sources, namely a reduced rate of removal of glucose from the blood by the peripheral tissues and an increased rate of release of glucose from the liver into the circulation.

Consequences of Hyperglycaemia and Glycosuria :

When the glucose concentration in the blood exceeds the capacity of the renal tubules to reabsorb it from the glomerular filtrate, glucose spills into the urine. In most people the level of blood glucose at which this happens is approximately 10 mmol/1 (180 mg/100 ml). Glucose increases the osmolality of the glomerular filtrate and thus prevents the reabsorption of water as the filtrate passes down the renal tubular system. In this way the volume of urine is markedly increased in diabetes and polyuria and nocturia occur. This in turn

leads to loss of water and minerals which results in thirst and polydispsia.

Consequences of Poor Glucose Utilisation :

Impaired utilisation of carbohydrate results in a sense of fatigue, and causes two main compensatory mechanisms to operate in an attempt to provide alternative metabolic substrate. Both of these lead to loss of bocy tissue, that is wasting, which may occur in spite of a normal or even an increased intake of food, and which is additional to any loss of weight resulting from loss of body fluid.

2.5 **Pathology :**

In Juvenile-onset type histological examination of pancreas show marked changes in the islet tissues of pancreas which is sufficient in itself to account for the disease. The abnormality consists essentially of the degeneration of the islet tissue, from which the beta cells have largely disappeared, leaving behind a variable number of alpha cells and a majority of small undifferentiated cells. The remaining beta cells show evidence of excesssive activity; the nuclei are commonly enlarged with degranulation of the cytoplasm. These appearances of the pancreas are consistent with the fact that most young diabeties have extremely low plasma insulin levels when first seen.

In the middle-aged and elderly, the majority of whom do not require treatment with insulin, the moderate reduction in the total mass of islat tissue which is commonly seen does not appear to be sufficient in itself to account for the degree of impaired carbohydrate tolerance shown by many of these patients. On the other hand, the observation that in many cases the beta cells, despite prolonged hyperglycaemia and their reduced number, fail to develop cytological signs of hyperactivity, suggests that in these diabetics the beta cells may be relatively insensitive to the stimulus of an elevated blood glucose. Failure to respond to hyperplycaemia could result from vascular lesions or from alterations in the islet stroma, interfering with the exchange between the blood and the islet cells. Fibrosis, hyalinisation, and fibrin deposits in the pericapillary space and changes in the islet epithelial basement membrane are often present in older diabetics.

Long-standing diabetes is commonly associated with a general disorder of small blood vessels which is seen as an abnormal thickening of the basement membrane of the capillaries throughout the body.

2.6 **Actiology :**

Based on the actiology two main types-primary and secondary - of diabetes mellitus are recognised. In the Primary DM are the two main clinical types described earlier: Juvenile - onset (insulin dependent) and Maturity - onset (insulin - independent) diabetes. Althought the precise cause is still uncertain, several contributing factors are known to be involved.

1. **Age and Sex :** While the disease may find an onset anytime 80% of the cases occur after 50 years. There are more young male diabetics than female; in middle age, women are more often affected. Repeated pregnancy may add to the likelihood.

2. **Heridity :** In both types of DM a familial tendency exists. Genetic factors appear to play a greater role after 40 years of age.

3. **Infection :** Juvenils type was once thought to be due to some viral infection destroying the p cells of the Islet of Lingerhans. In general, infection of any kind may be important in unmusking latent diabetes in the middle aged and the elderly.

4. **Obesity :** The association of obesity and diabetes has long been recognsied but it is still uncertain whether obesity is the result or the cause os diabetes. Most of the evidence appear to suggest that obesity is diabetogenic. Overeating especially when combined with underactivity is associated with a rise in the incidence of diabetes in the middle-aged and the elderly.

5. **Auto Immunity :** Considerable evidence now exist in support of the hypothesis that insulin-dependent diabetes is an auto immune disorder irrespective of the age of onset of the disease.

The immune system, a protective system to warm and fight the external organism, basically recognises the danger in the form of an external organism. The sensors should clearly delineate who is the enemy and who is the friend! In Diabetes, the immune system starts recognising its own Pancreatic cells as foreign micro organism and thus an enemy. Hence, it starts destroying the insulin producing cells. Or it lines up a series of antibodies around the 'P' cells of the Islet of Langerhans preventing insulin to come out. Though here is enongh insulin produced in the pancreas, the auto immunity mars the insuline effectiveness.

Why this auto immunity? Yet the answer is to be found. Reaserch is going on. One of the major factor is the 'STRESS'; it is the psychological stress and the emotional imbalance that brings about auto immunity; the evidences in favour of this finding are increasing.

The Secondary Diabetes Occur as a result of a recognisable pathological process or secondary to the treatment of some other condition :

(1) Some diseases of the pancreas like pancreatitis, cause distruction of the pancreas and lead to impaired secretion and release of insulin. Diabetes will also follow pancreatectomy.

(2) DM occures because of administration of certain harmones which are insulin antagonists like growth harmone, Adrenocortical hormones, Adrenaline, Thyroid harmone etc.

(3) Intragenic Diabetes in those genetically susceptible, may be precipitated by various forms of therapy notably corticosteroids.

(4) Liver Disease, particularly cirrhosis and hepatitis, may be associated with impaired glucose tolerance.

3. MANAGING THE DIABETES MELLITUS :

The ideal treatment for DM would allow the patient to lead a completely normal life, to remain not only symptom free but in positive good health to achieve a normal metabolic state and to escape the complications associated with long term diabetes.

There are three methods of treatment and each involves an obligation for the patient to adhere to a dietary regimen for the reminder of his life :

(i) Diet alone (about 50% of new cases)

(ii) Diet and oral hypoglycaemic drugs (about 30%)

(iii) Diet and insulin (about 20%)

3.1 DIET : General Principles :

The treatment of all diabetic patients, especially those who require insulin, involves some dietary restrictions if control is to be satisfactory. By regulating the amount and the times of food intake, particularly the carbohydrate intake, and by dove-tailing the dose of insulin, or of oral hypoglycaemic agent, an attempt is made to achieve a flat profile of glycaemia throughout the day and night. It is but obvious that if the intake of food varies from day to day it is impossible to work out a steady insulin or other regime to cover it. It is extremely important that patients should understand that this is the main reason for dietary restriction. Many have the mistaken idea that the main purpose of dietary measures in their treatment is the avoidance of certain 'bad' foods.

The first step in preparing any dietary regimen is to map out a time-table of the patient's day including a description of his usual meals. This is an essential step and one which is too often omitted. The total daily requirement of calories must next be decided. The diet must be nutritionally adequate for the patient's needs, and it must, therefore, be estimated for each individual patient after considering such factors as age, sex, actual weight in relation to desirable weight, activity, occupation, and financial resources. An approximate range for the various groups might be (1) an obese, middle-aged or elderly patient with mild diabetes, 1,000–1,600 kcal daily, (2) an elderly diabetic but not overweight, 1,400–1,800 kcal daily, (3) a young, active diabetic, 1,800–3,000 kcal daily. The importance of maintaining the body weight at or slightly below the ideal for the patient's height cannot be overemphasised. Thus the calorie range of group 2 may have to be extended if it is not sufficient to maintain weight, and young patients in group 3 who are overweight may have to reduce their daily intake to below 1,800 kcal, perhaps temporarily.

The daily intake of carbohydrate to be prescribed ranges from the minimum of 100 gms. daily to a max. of 240–260 gms. The consumption of protein is largely determined by Social and economic consideration and will frequently be lower than would be considered desirable. The fat intake should be adjusted to bring the total calories to the level desired and will usually amount to 50–150 gms daily.

3.2 Oral Hypoglycaemic Drugs:

A number of compounds are effective in reducing the hyperglycaemia in patients who would otherwise require insulin. They can be grouped into :

(i) *Sulphonylureas :*

Tolbutamide is the mildest and probably also the safest of the sulphonylureas. It should be administered 2 to 3 times a day. Side effects like skin rashes etc. are rare. Unfortunetely, relapse rate is high.

These are valuable in the treatment of patients with maturity-onset diabetes who fail to respond to simple dietary restriction and who are not overweight. They should not be given to obese patients as their weight will increase.

(ii) *Bigvanides :*

These have higher incidence of side effects, particularly gastro intestinal symptoms. They can be used

(a) in mature–onset obese patients

and (d) in combination with sulphonylureas.

3.3 Insulin :

With one or more of the preparations of insulin available it is usually possible to keep the blood glucose within reasonable, although not physiological, limits throughout the day and night without undue risk of hypoglycaemia.

Two main therapeutic forms of insulin are available, namely (1) rapid–onset, short–acting and (2) delayed–onset, long–acting or 'depot' preparations.

(a) **Soluble Insulins :** These are clear solutions in contrast to the depot insulins which are cloudy. When injected subcutaneously, soluble insulin is rapidly effective (Table 11.2) but the action is reletively short–lived. A patient stabilised on soluble insulin alone would therefore need at least two injections in the day.

Soluble insulin is essential in the following circumstanees :

(i) For new cases with severe dehydration or ketoacidosis.

(ii) For emergencies associated with ketosis, such as acute infection, gastroenteritis and some surgical operations.

(iii) For the treatment of nearly all young patients.

(b) **Depot Insulins :** In a relatively small number of cases an adequate degree of control can be established by a single morning injection of depot insulin. Such patients are usually elderly with relatively mild diabetes. Most insulin–requiring diabetics however do best on a depot insulin with one or two supporting doses of soluble insulin.

3.4 Hypo Glycaemia :

If one injects too much insulin the blood glucose level will drop and a dangerous condition called Hypoglycaemia can occur. The symptoms of hypoglycaemia are :

(a) early – Weakness, hunger, sweating, palpitations, tremor.

(b) later – dizziness, confusion, unsteadiness.

(c) advanced – drunken appearence, mental confusion, slurring speech, imbalance, excessive sleep.

(d) Very advanced – Unconsciousness (coma)

Remedy of hypoglycaemia is simple ; eat some pure glucose ; keep always some sweets in your pocket. If there is no response in 10 mts, rush to the nearest hospital or doctor.

4. YOGA THERAPY IN THE MANAGEMENT OF DM.

4.1 Yoga Therapy Principles

In our earlier reports [5,6] we presented the basis for the integrated approach in Yoga Therapy and the principles underlying such an approach. Application to various ailments of the psychosomatic origin has been presented in ref 5. In ref 6

its extensive application in handling bronchial asthmatics has been discussed. These reports and the book on Asthma and Diabetes[7] indicate the coming up of the new approach in handling these 'incurable' ailments. We will briefly recall the principles of Yoga therapy before we proceed to present its application to D.M.

(a) Yoga is a conscious process for effectively elevating a human being from his subnormal level to super human heights.

(b) Therepeutical applications are part of the overall Yoga methodology.

(c) The integrated approach in Yoga Therapy adopted by us operates at the physical, mental, emotional, intellectual and spiritual levels by varied Yogic practices.

(d) The key principles are

  (i) deep relaxation – alertful rest
  (ii) increased stamina – forbearance
  (iii) internal awareness

(e) Adopting these basic facets, the organs and systems are brought to normalcy, revitalised and strengthened by physical exercises, Kriya and asanas, breathing practices and pranayama, emotional control through devotional session, Dhyāna and Vichara (analysis and self awareness).

We will now present the approach as applied to D.M.

4.2 Yoga Therapy and D.M.

We have seen that the immune system's abnormality possibly due to stress factor is the chief aetiological factor in D.M. The beta cells of the pancreas do not secrete the necessary insulin into the system.

The deep relaxation to the overall system should help to release the stresses at the immune system level and normalise its functioning. The revitalisation of pancreatic beta cells should further solve the basic problem. Except in those cases where all the pancreatic tissues are destroyed, the possibility of rehabilitation of diabetics of both types by the Yogic approach will be bright.

4.3 Working at the ANNAMAYA KOŚA LEVEL :

Physical exercises and Śithilikaraṇa Vyāyāma[5] are used to stimulate the inner organs; the sedantry habits are effectively replaced by these joyful practices taken up by the patients. Not only do these help to loosen the joints bring flexibility and suppleness to the muscular system, they also help to develop the stamina and power of forebearance.

Kriyas – Dhouti, Agnisara and Śanka Prakṣalāna[10] – are of special use in reverting the hyperglycaemiac condition. Agnisara performed daily help to revitalise the pancreas. Dhouti Kriyas are prescribed for the patients once a week. While Śankhaprakṣālana is adopted once in 15 days or a month. The special techniques developed to simplify these cleansing processes have made possible for one and all to easily perform these otherwise difficult Kriyas.

The basic set of Yogic Practices used for D.M. is given in Appendix 1. Asanas help to effectively revitalise the pancreas

by localised stretch and relaxation inherent in some postures. The patients are made to develop an inner awareness and move towards Sthira, Cira and Sukha stages of the Yogic Postures [6].

4.4 Operations at Pranamaya Kosa level :

The imbalances in the Prāṇa at this level probably carry the psychological stresses and emotional upsurges to the physical sheath. Apart from handling the physical sheath by Asanas Kriyas etc., it is equally important to erase the Prānic imbalances.

Sectional breathing with emphasis on abdominal breathing, Kapālabhāti, Bhastrika and other Prāṇāyamas are used to operate at this level.

4.5 'Manomaya' operations :

Characterised by deep relaxation, alertful rest, single thought and expansive feeling, Dhyāna has proved a great boon and could become a fine tool in the management of D.M.

The devotional sessions using Prayers, Chants, Bhajans, Namāvalis etc bring about the emotional control stabilizing the emotional personality. Thus, the system becomes more stable.

5. PATIENTS & METHODS

Fortynine patients with established D.M. have been treated using the Integrated approach of Yoga Therapy. The programme lasted 15 days 2½ hours daily in the evening. Two sundays were used for teaching Kriyas including Śankhaprakṣālana. Distinct in the programme presented here are the following features of the integrated approach :

(i) Half to ¾ hour lecture session meant to explain the participants the nature of D.M., Aetiology, treatment by drugs etc and the theory of Yoga practices applied to D.M. in particular.

(ii) A practical session lasting 1½ to 2 hours teaching them the set of Yogic practices (Appendix) prescribed for them.

The patients learnt the techniques effectively in the group being taught by Yoga teachers trained specially for the purpose. Personal attention formed the chief feature of the programme. Regular corrections were done and the proper method of performing the Asanas and of using other Yogic practices to their fullest advantage was imparted to the patients. In each of the practices emphasis was laid to develop the internal awareness to help the participants grasp and experience the basic facets of deep relaxation and enhanced forbearance power (stamina) knit in the practices.

The proforma designed to get the necessrry details include the following parameters :

Age, Sex, Height, Weight, Duration of D.M., whether control is good or bad with or without drugs, the complications, if any, Urine Sugar, Blood Sugar (F.B.S. and R.B.S. or P.P.B.S.), the Medication (including hypoglycaemic drugs and injections per week) and their diet. Schedule were recorded.

The detaiis were taken 10 days and 1 day before the programmes. Also their case history record for the previous month was noted. These data taken on a randomly selected group of patients served as the base line (Control).

DR 433
GIS21

COMMUNITY HEALTH CELL
47/1, (First Floor) St. Marks Road
BANGALORE - 560 001

For all the patients, the complete set of data before and after the 15 days programme was recorded. For a selected group of patients daily Urine Sugar also was recorded.

During the programmes the patients were asked not to stop the medication suddenly even if they felt better. They were asked to take advice of the doctor to reduce and eliminate their drug usage. Depending on the efficacy of their mastery over the Yogic practices, they were suitably advised.

After the completion of the programme they were asked to continue the practices and report to us about their progress periodically.

6. RESULTS & DISCUSSIONS

The basic data are presented in Table 1. The data include all the parameters based on the subjective report of the patients; interrogation by the doctor and the objective measurements.

The general impression of the patients during the Camp was that they experienced a marked improvement in their state of well being. They felt more agile, fresh and energetic all through the day, they reported.

The data on a group of patients taken 10 days and 1 day before the programme showed no significant change and formed the control data. Looking at the data in Table 1, it is evident that there is a clear improvement in most of the cases. Out of the 49, 22 cases showed a PPBS value greater than 180 (mgm/ml of blood) before the Camp. 19 out of these have shown improvement and in 3 patients PPBS has increased Out of the 19, in 11 patients the PPBS value has fallen below 180.

A statistical analysis on the 2 Parameters – Weight, Blood Sugar (FBS and PPBS) has been carried out using the students paired 't' test of significance. The results are shown in Table 2.

TABLE 2 : STATISTICAL ANALYSIS OF DATA ON DM

S.No.	Details	No. of Patients	Initial	Final	t	p
1	Weight	49	59.62 ± 7.77	58 82 ± 7.22	3.70	<0.005
2	Blood Sugar (FBS)	6	167.167 ± 36.65	150.83 ± 25.01	1.35	0.10
3	Blood Sugar PPBS – (2 hrs.)	45	177.66 ± 52.51	157.98 ± 42.2	5.32	<0.005

The reduction in weight is significant to a value of P less than 0.005. The average values are reduced from 59.62 to 58.82 with variance falling from 7.77 to 7.22.

The Fasting Blood Sugar data was available only on 6 patients and show no significant change.

The Post Prandial Blood Sugar (2 hrs. after the meal) show a marked decrease after the 15 days programme. The daily urine Sugar and periodic Blood Sugar checking showed a continuous improvement. The average value of PPBS reduced from 177.66 ± 52.51 to 157.98 ± 42.2 with

a P value less than 0.005 indicating a high degree of significance. Statistical Analysis was done to find out whether there is any significant change in weight in younger group (Age less than 40 years) as compared to the mature-onset type.

TABLE 3: WEIGHT REDUCTION IN TWO TYPES OF DM

S.No.	Details	No. of Patients	Initial	Final	t	p
1	Juvenile-onset type	12	60.67±13.43	59.67±13.81	5.77	<0.005
2	Maturity-onset type	37	59.55±6.5	58.38±10.28	3.99	<0.005

The results of such analysis shown in Table 3 indicate that there is a significant reduction in weight in both the groups. This goes to show that the Yogic practices have been effective in reducing the obese factor which would mean a favourable factor of improvement.

To ascertain whether the improvements noticed in D.M. are due to the weight reduction or some other factor, those cases in whom there was no change in weight were selected and an analysis made. So also for the group with weight reduction, a similar analysis was conducted and the results are shown in Table 4.

TABLE 4: REDUCTION IN PPBS IN CASES

(i) Where there was no reduction in weight.

(ii) Where there was reduction in weight.

S.No.	Details	No. of Patients	Initial	Final	t	p
1	No wt. change cases	18	195.5±55.16	171.39±47.14	4.65	<0.001
2	Wt. reduction cases	27	165.04±50.64	139.04±62.28	3.08	<0.001

Looking at the results, it is evident that the improvement in PPBS is slightly more in the first group (18 patients) with no weight change ($t = 4.65$) compared to the second group (27 patients) with reduction in weight ($t = 3.08$). This clearly goes to show that the improvements in P.P.B.S. are not merely due to a reduction in weight.

We feel that the psychological stress removal by deep relaxation and internal awareness might have been the key factor in bringing about these significant changes depicted herein. Also revitalisation effects of Kriyas and Prāṇāyama might have contributed to the notable improvements observed.

7. SUMMARY & CONCLUSIONS

1. Investigations on 49 patients of Diabetes Mellitus in the age group 14 to 69 have been carried out using the integrated approach of Yogic practices.
2. The duration of treatment was 15 days, everyday evening $2\frac{1}{2}$ hrs.
3. The integrated approach consisted of a lecture programme (Vichāra), Śithilikarana, Vyāyāma, Asanas, Breathing practices and Prāṇāyāma session followed by a devotional session and meditation.
4. The data show significant improvement in all the parameters. Weight and Blood Sugar (FBS & PPBS) in particular.
5. Even among the group where there was no change in weight, there was a significant decrease in PPBS indicating that the results may not be due to reduction in obesity, but probably due to removal of stresses.
6. The results are equally significant among the Juvenile type.
7. These go to suggest that the possibilities of using the integrated approach are bright.

REFERENCES

1. Brena, S.F., Yoga and Medicine; Pub : The Julian Press Inc. NY, 1975.
2. Childs, J.P., The use of TM programme as a therapy with juvenile offenders. Sc. Res. TM. Coll. Pap, 1976, Vol. 1 P 577–84.

3a. Kuvalayananda, Swami and Venekar, S.L., Yoga Therapy – Its basic Principles and Methods; Pub : Govt. of India, 1971.

3b. Kuvalayananda, Swami Asanas (3rd Impression) Pub : Popular Prakashan, Bombay, (5th Ed.) 1972.

4. Macleod, J. (Ed.) Davidson's Principles and Practice of medicine. 12th Ed. Pub : English Language Book Society, 1977.

5a. Nagarathna, R. and Nagendra, H.R., Therapeutic application of Yoga–a Report; Report No. VKYTRC / 001 / KK, Pub : Vivekananda Kendra Yoga Therapy and Research Centre, Kanyakumari, 1980.

5b. H. R. Nagendra. The Basis for an Integrated Approach in Yoga Therapy. Report No. VKYTRC/002/KK/1980. Pub : Vivekananda Kendra Yoga Therapy & Research Centre, Vivekanandapuram, Kanyakumari – 629 702, December 1980.

6. H.R. Nagendra[1], R. Nagarathna [2], and R, Uma[3], An Integrated approach of Yogic Practices in the Treatment and Rehabilitation of Bronchial Asthmatics Report No. VKYTRC/004/KK/1981.

7. Shankaradevananda Saraswati, Swami. Yogic Management of Asthma and Diabetes. Pnb : Bihar School of Yoga. 1977.

8. Sivananda Saraswati, Swami. Yogic Therapy; Pub : Umachal Yogashram, Gauhati, 1965.

9. Varandani, N. et al. Diabetes and Yoga. Paper for first Scientific Seminar of C.C.R.I.M.H.

10. YOGA – an instruction booklet; Pub : Vivekananda Kendra Prakashan, Singarachari Street, Triplicane, Madras, (2nd Ed.) 1980.

TABLE : 1 BASIC DATA OF DIABETES MELLITUS

Sl. No.	Reg. No. YTNRBD	Age	Duration	Control		Drugs		Others ymptoms	Weight	F.B.S.	R.B.S	P.P.B.S	Medication No. of Tab. or Inj. /week
				Good	Bad	With	With-out						
1	01	70	7	+		+		Pain in back	66/65				7/7
2	02	44	2	+		+		Knee	62/			170/190	7/7
3	03	54	7		+	+		White patch	52/52	206/180		220/180	7/7
4	04	57	6	+		+		—	54/54	130/120			10½/7
5	05	33	6		+	+		—	53/53			236/228	7/–
6	06	41	4	+		+		—	78/75			160/154	14/14
7	07	37	2.5	+		+		—	75½/72	/110	/110	124/110	7/0
8	08	48	3	+		+		—	61/60	/128	144/150	144/150	—
9	09	41	2	+		+		Loosing wt.	46/44			100/108	10½/7
10	10	56	2		+	+		—	66/66	/100		240/100	3½/3½
11	11	56	1	+				—	70¾/65½			120/110	7/7
12	12	44	12		+	+		Easily tried lack of enthusiasm	54/54	215/180		290/240	14/7
13	13	22	9	+		+		Throat infection of	53/52		220/160	160/110	60/55
14	14	35	4		+	+		—	40/39			220/180	7/7
15	15	70	4	+		+		—	54/54			110/110	13/4
16	16	57	10		+	+		Shoulder pain	55/55			280/290	20/20
17	17	56	1	+		+		—	59/57			140/146	7/7
18	18	40	4	+		+		Cold attacks	66/65			110/114	7/42
19	19	48	17	+		+		—	80/79			160/140	40/0
20	20	49	2	+		+		—	74/72			120/114	0/0
21	21	44	3	+		+		—	65/64			130/136	7/7
22	22	59	2	+		+		Chest pain	63/60	170/122		170/122	0/0
23	23	37	11		+	+		Burning feet	46½/47			230/160	40/35
24	24	58	8	+		+		—	59/59			184/153	7/7

TABLE : 1 BASIC DATA OF DIABETES MELLITUS — Contd.

Sl. No.	Reg. No. YTNRBD	Age	Duration	Control		Drugs		Other symptoms	Weight	F.B.S.	R.B.S	P.P.B.S	Medication No. of Tab. or Inj. /week
				Good	Bad	With	With-out						
25	25	59	2		+	+		—	60/60	130/		146/120	0/0
26	26	36	4	+		+		—	60/59			128/120	7/7
27	27	48	14		+	+		Giddiness	60/60			206/164	14/14
28	28	40	1	+		+		Giddiness	60/60			140/206	44/14
29	29	35	1	+				Headache	69/67			126/127	0/0
30	30	49	10		+	+		—	74/72		107	220/200	0/0
31	31	47	2	+		+		—	54½/53	132/150		150/145	7/0
32	32	19	14		+			—	50/50			195/160	60/60
33	33	27	7					—	48/48				
34	34	58	1	+				—	59/58			140/130	10½/10½
35	35	62	5	+		+		—	60/59½	180		158/146	7/7
36	36	67	8	+		+		Colds	59/59			140/128	10½/7
37	37	40	3	+		+		Leg pain	65/65			180/176	7/7
38	38	44	6	+		+		—	58/57		125/100		7/0
39	39	47	12		+	+		—	57/57			244/200	14/7
40	40	59	20		+	+		—	48/47½			232/338	½/½
41	41	34	½	+		+		—	65/63			168/154	7/7
42	42	50	6	+		+		Headache General weakness	59/59½		103/100	120/116	0/0
43	43	56	16	+		+		—	66/66	160		178/160	7/7
44	44	50	9	+		+		—	60/60			112/116	14/7
45	45	52	17		+	+		Tiredness	57½/57	240		260/160	25/20
46	46	39	1½		+	+		—	67½/66			260/225	60/60
47	47	69	12		+	+		—	54/54			260/200	7/7
48	48	41	8		+			—	65½/65	150/168		240/211	0/0
49	49	31	2½	+		+		—	43/43			148/140	0/0

CONTENTS

REPORT No. VKYTRC / 006 / KK / 1980 — Page No.

Integrated Approach of Yoga Therapy for Hypertension

1. Introduction 1
2. Scientific facts about Hypertension 3
   2.1. The Circulatory System (Figure 1) 3
   2.2. Nervous control of heart : 4
   2.3. Hypertension 4
   2.4. Clinical features of Hypertension 5
   2.5. Complications 5
   2.6. Treatment 5
3. Integrated approach of Yogic Practices & Hypertension 6
   3.1. Asanas – the physical sheath 6
   3.2. Breathing and Pranayama – The Pranic Sheath 6
   3.3. Manomaya Sheath Dhyana 6
   3.4. Vijnanamaya Level – Vichara 6
4. Patients and Methods 7
5. Results and Discussion 8
6. Summary and Conclusions 8

References 9

Tables 11

List of Yogic Practices for Hypertension and IHD 12

REPORT No. VKYTRC / 007 / KK / 1981

Yoga Therapy for Ischaemic Heart Diseases – Feasibility Studies

1. Introduction 13
   2.1. A look at our heart 15
   2.2. Cardio Vascular ailments 15
      (a) Atherosclerosis 15
      (b) Heart attacks 16
      (c) Angina pectoris 16
      (d) Congenital Heart defects 16
      (e) Congestive heart failure 16
   2.3. Aetiology : Causes of IHD 17
   2.4. Treatment 17
      (i) General advice 17
      (ii) Drugs 17
3. Yoga Therapy of IHD 17
4. Patients and Methods 18
5. Results and Discussions 18
6. Conclusions 19

References 19

Tables 20

List of Yogic Practices for Hypertension and IHD 21

Report No. VKYTRC / 006 / KK / 1980

Integrated Approach of Yoga Therapy for Hypertension

by

R. NAGARATHNA* & Dr. H. R. NAGENDRA**

ABSTRACT : Nineteen Hypertensives are treated by the Integrated approach of Yogic practices in a 2 weeks programme tailored to cater to the needs of the Urban dwellers. Lasting $2\frac{1}{2}$ hrs. every evening, the programme introduced under the supervision of a competitive doctor, the principles and practice of the integrated approach applied specifically to Hypertension. The pre and post programme data collected indicate a clear improvement in the general well being of the patients.

The statistical analysis of the data show a significant reduction in Systolic B.P., less significant reduction in medication and diastolic B.P.

1. INTRODUCTION

'The primary or essential hypertension is earned and acquired rather than inherited, bequethed or bestowed [13*]. Although the tendency to it may be constitutional gift of the genes, the disorder is largely psychosomatic. The clinical definition of abnormal limits of Blood Pressure (B.P.) are illusory and vague. The individual, racial and regional differences of tolerance of the system to high blood pressure levels are not yet fully determined and differentiated'. The normal B.P. gradually rises with age [8]. Hypertension is defined arbitrarily at levels above the generally accepted normals, for example, 140/90 at the age of 20 rising gradually to 170/105 at the age of 75. While in Indian conditions 120/80 and 150/100 appear to be the corresponding normal values. Hypertension is present in 15% of the population. The disorder is symptomless until complications arise so that diagnosis depends on routine screening when patients attend their doctors for other reasons. However, the diagnosis is bedeviled by problems.

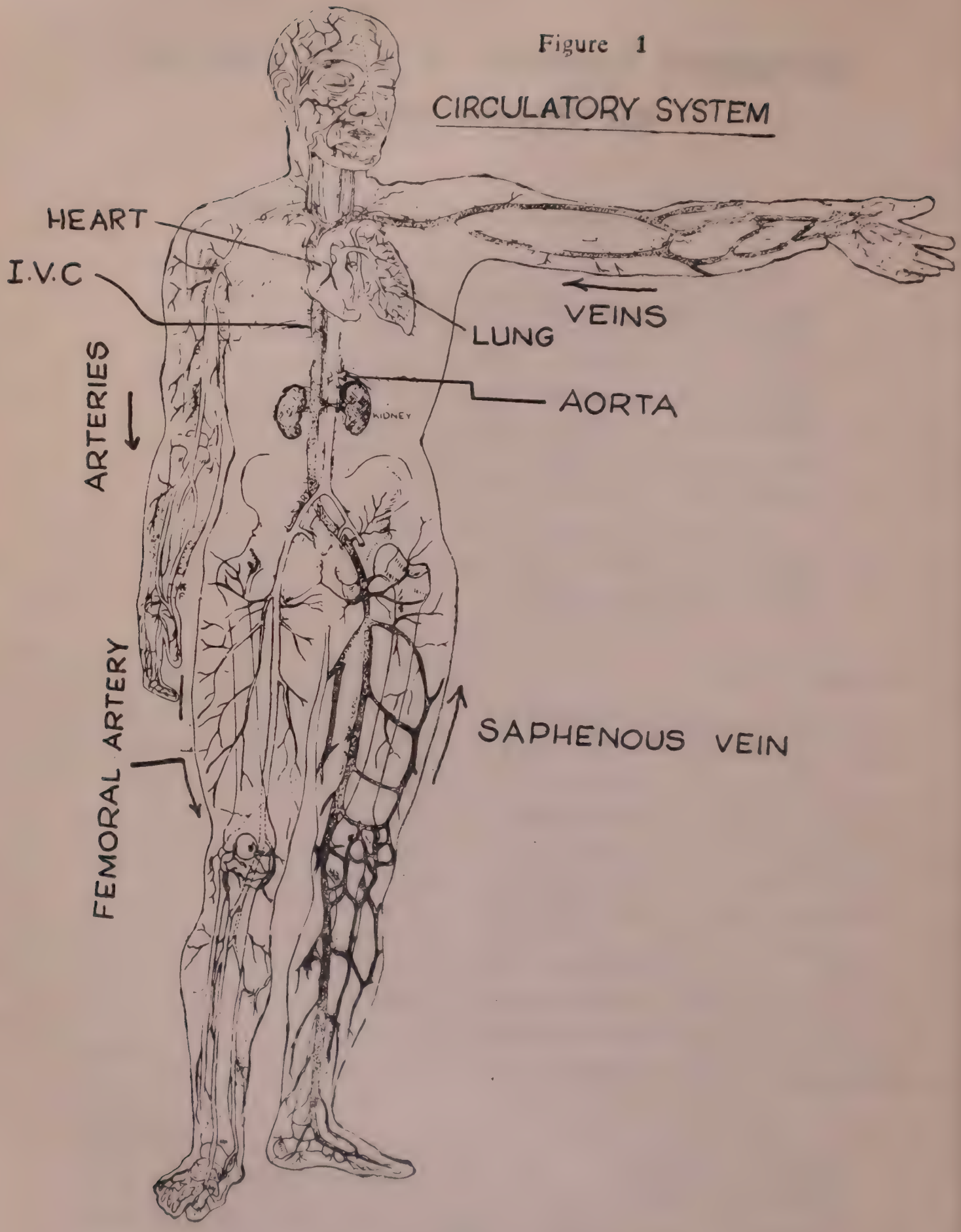
* Superscripts denote references at the end

* Chief Consultant,
Vivekananda Kendra

** Secretary, Yoga Shiksha Vibhag
Vivekananda Kendra

Published by : Vivekananda Kendra Yoga Therapy & Research Centre
Vivekanandapuram, Kanyakumari-629 702.

Figure 1


CIRCULATORY SYSTEM
HEART
I.V.C
LUNG
VEINS
ARTERIES
AORTA
KIDNEY
FEMORAL ARTERY
SAPHENOUS VEIN

It has become obvious for the modern man that hypertension is predominantly a psychosomatic like disorder caused by stressful life. The increasing incidence of hypertension in the modern era of tensions clearly strengthen the view [6] that it is the stress which is at the base of Hypertension.

'There is no 'ideal' antihypertensive drug available. The secondary effects are often unpredictable and their toxicities may create iatrogenic illnesses. Worst of all may be their toxic and unwanted influence on the mind and the autonomic nervous system through alterations in enzymatic and chemical mediators [13].

There are a large number of research investigations in the use of Yoga techniques in the management of hypertension [3,10]. Transcendental meditation, a systematised technique of Dhyana [1,2,9,15,16] has been used extensively in handling hypertensives. Shavasana [5,7], Yoga Nidra [13] and the biofeed back [4,12,4] have been used extensively in recent times as an effective tool for managing hypertension. An integrated approach of Yogic practices based on the Upanishads and Yoga texts [9] is being used to handle modern ailments of the psychosomatic type. In this report is presented the adoptation of this approach to a group of hypertensives. After dealing with current state of knowledge about hypertension in the next section, we proceed to present the Yoga therapy applied to this ailment. Results, discussions and conclusions follow.

2. SCIENTIFIC FACTS ABOUT HYPERTENSION

2.1 The Circulatory System (Fig. 1)

Blood carries the nutrient material to every cell in the human body. For this purpose blood (total quantity approximately is 1/13 of the body weight) is being constantly circulated throughout the body by the pump–heart, and the pipes – the arteries, capillaries and the veins. While going away from the cells, the blood is loaded with carbon dioxide, Urea, etc., which the cells throw into it as waste products. They are eliminated through lungs, skin and kidneys.

The pear shaped heart built of strong cardiac involuntary muscles contracts and relaxes about 70 times a minute in a healthy individual. Its contraction is called the Systole (the time of action) while the relaxation is known as Diastole (the time of rest). Normally the diastole is slightly longer than the systole. The pressure of blood during contraction is high and forms the systolic pressure and that during rest (lowest pressure) is the diastolic pressure.

The impure blood from all over the body is poured into the upper chamber of the right portion of the heart (right atrium) by two main veins (superior and inferior vena cava). When full, the right atrium contracts to force the blood to right ventricle (the bottom chamber of heart), which when full contracts and forces the blood to lungs through pulmonary artery. After throwing away the impurities in the lungs, the pure blood (saturated with oxygen) returns to the left atrium (upper half part of heart) by the pulmonary vein. The contraction left atrium forces the blood to left ventricle (left lower cavity) which when full contracts and forces the blood to various parts through the main artery (called Aorta). Thus, the pure blood reaches different parts of the body by various branches of arteries. The blood flows slowly through thin walled capillaries

around the cells. After supplying the nutrients to the cells the blood returns through the veins and the circulatory cycle is complete.

2.2 Nervous control of heart :

The Sinus node, the pace maker of the heart, a small round piece of nervous tissue inside the right atrium sends out rhythmic impulses to make the muscle tissue contract. At the junction between the atria and ventricles there is the A–V node (atrioventricular node) which slows the impulse down. Then the impulse travels down a special system of conduits (purkinje fibres) to all cells of the heart muscle and the contraction takes place.

The rate of contraction is controlled by the Autonomous Nervous System (ANS). The sympathetic component speeds up the heart to face the external threats or any stressful situations whereas the parasympathetic system allows the body to prepare for relaxation. We usually swing between these two components. There is a distinct relation of about 4 : 1 between heart rate and breathing rate and this in turn is related to the mental state which is mediated by the ANS. Hypothalamus is the highest centre of control of sympathetic activity.

The blood pressure is constantly monitored by baroreceptors and a complicated auto regulation system immediately makes adjustments to maintain blood pressure despite changes in posture, the effect of exercise, heat, changes in the salt and water intake, fluid loss and other variables. The maintenance of normal B.P. even in health is now recognised to be a process of somewhat daunting complexity.

2.3 Hypertension :

Hypertension in any of its many forms is a serious disease. It is particularly dangerous because it is 'silent' illness. There are two types of hypertension :

a. Secondary Hypertension (about 20%)

The main causes of secondary hypertension are :

i. Coarctation of the aorta.

ii. Renal disease : (a) Parenchymatous e.g. acute and chronic glomerulonephritis; peylonephritis; systemic lupus erythematosus and polyarteritis nodosa. (b) Polycystic kidneys. (c) Renal artery stenosis.

iii. Endocrine disorders and hormone therapy: (a) Phaeochromocytoma. (b) Cushing's syndrome. (c) Primary aldosteronism (Conn's syndrome). (d) Oral contraception. (e) Oestrogen therapy.

iv. Pregnancy.

b. Essential Hypertension - Constitutes 80% of cases of hypertension. No specific cause is detectable in these cases. The main incidence is between 40–60 years of age. The part played by temparament and emotional factors is important. In these patients the blood vessels are highly sensitive and thus can over react to nervous (emotions & stresses) stimuli by big rises in blood pressure. Intially these upsurges return to normal levels with rest, but over the years even the basal levels tend to remain high resulting in hypertensive disease. Smoking is known to aggravate the condition.

2.4 Clinical features of Hypertension :

Hypertension is frequently discovered on routine examination of apparently healthy subjects. Symptoms are generally attributable to the complications of the disease, whether from a cerebrovascular accident, from haemorrhages in the retina or visual pathways or from left ventricular failure. Coexisting arterial disease, causing angina or intermittent claudication, is also commoner than in those with normal blood pressure. Minor symptoms such as headache, dizziness, irritability, fatigue and insomnia are widespread in the population and tend to be inappropriately attributed to the hypertension when it is found. Such symptoms are commoner in patients who know that they have hypertension. The occasional patient with malignant hypertension has severe headache which is relieved by adequate treatment.

2.5 Complications :

(i) CARDIAC : The left ventricle at first maintains a normal blood flow by hypertrophy. Later the left ventricular output can no longer be maintained and slow decompensation of the heart may become manifest. Breathlessness on exercise may occur and sudden noctural breathlessness may be the presenting symptom in hitherto unsuspected hypertension. Coronary artery disease is more frequent in patients with hypertension.

(ii) CEREBRAL : Cerebral ischaemia and haemorrhage are common. Visual disturbances occur if the optic pathways are involved in vascular lesions.

2.6 Treatment :

In secondary hypertension if the detected cause is removed they remain cured of their hypertension. Hence whenever a patient is first seen with high B.P., all investigations are directed towards detecting removable causes.

There is no specific treatment for essential hypertension. The aim of the therapy is to lower the B.P. using rest, diet, avoidance of stress and drugs.

a. **General advice :** When significant hypertension is discovered and found to be persistently present, it should be explained to the patient that unless the blood pressure is modified to more normal levels he is at risk of developing one of the complications of hypertension. He has to realise that once drug treatment is embarked upon it will need to be continued for life–at least in the present state of knowledge. The establishment of a good relationship between the doctor and the patient is very important. The previously asymptomatic patient who develops side–effects of treatment needs particular help : appropriate readjustment of the dose or a change of drug may restore his confidence. As with the diabetic, the treatment has to be reviewed regularly.

b. **Antihypertensive drug therapy :** There is a wide variety of drugs available for the physician to choose from. He is obliged to continue medication even when the symptoms are ameliorated. If the drug is stopped he runs the risk of B.P. raising to original level or even higher. This is called rebound effects.

Many agents are now available but there is a growing consensus as to policy. The most logical plan is to use the smallest possible number of drugs in the smallest possible quantities to achieve effective blood pressure control, which is usually

accepted as a lying diastolic pressure of 90 or less at rest. By combining drugs when necessary it is possible to avoid the undesirable side-effects which may result from an excess of any one of them. The drug regime has to be tailored to the individual, for there is considerable variation in the side-effects with any one drug from one patient to another. The physician should not be content until the patient's blood pressure is under good control with minimal or absent side effects. Elderly patients often tolerate hypertension better than the ill-judged treatment.

3. INTEGRATED APPROACH OF YOGIC PRACTICES & HYPERTENSION

The principles of Yoga Therapy used in the management of Hypertension are :

(i) Deep relaxation at both physical and mental levels.

(ii) Revitalisation of blood vessels and heart.

3.1 Asanas – the physical sheath :

The set of Yogic practices used in our programme to treat hypertension is shown in Appendix. Often the patients with severe HT are made to start with relaxation asanas, Śavāsana and Makarāsana and gradually standing and sitting postures are introduced. In the final posture they are made to learn the 'Prayatna Śaithilya – Relaxation of effort' and operate at 'CIRA' level and learn to go to 'SUKHA' stage. Slow movements and relaxed postures help the patients to start using the technique of relaxation in all postures and actions. As the technique of relaxation is picked up, more difficult asanas are introduced. This helps them to retain the relaxation response in the presence of a physical stress. The lowered metabolic rate helps them to work with greater freshness and relaxation. By continued practice and progressive improvements, the patients learn the art of localised relaxation.

3.2 Breathing and Pranayama – The Pranic Sheath :

Normalisation of breath and development of awareness regarding our breathing are accomplished by breathing practices and sectional breathing. Revitalisation of the organs and toning up of the nervous system occur with the use of Prāṇayāma. The slow, rhythmic, balanced breathing characteristic of Prāṇāyāma harmonises the functioning of various systems in our body, reduces the metabolic rate and brings the balance in the Prānic flows. Thus, the Prāṇic sheath gets purified.

3.3. Manomaya Sheath Dhyana

Dhyāna-relaxed state of mind achieved through meditation plays a vital role in erasing the psychological stresses even at the deeper layers of the mind. Continuous stresses being built during the interactions with the external world get diffused during sessions of dhyāna.

One of the effective and powerful tools used to erase the emotional instabilities has been the devotional session. Emotional Control and stability are the results.

3.4. Vijnanamaya Level : Vichara

Use of the conscious discrimination faculty effectively helps to obliterate the basic obsessions, fears and mental blocks. The knowledge about our inner structure,

and original blissful nature is pointed out in these 'Self analysis' sessions. Some times principles of 'Transactional Analysis' are taught to them. The lecture and discussion session are of great value in loosening the knots of deep attachements and strong likes and dislikes which help the patients in building great confidence in themselves so that they can govern themselves effectively without developing stresses.

4. PATIENTS AND METHODS:

Nineteen Hypertensives in the age groug of 35–78 (15 males and 4 females) have been treated by the application of integrated approach of Yogic therapy. This non residential programme lasted for 15 days. The patients underwent a session of $2\frac{1}{2}$ hours daily in the evening. On sundays they all joined for a longer session. The regular evening sessions covered the following aspects :

(i) A lecture session lasting about 45 minutes in which the following topics were covered : Anatomy and physiology of circulatory system, 'what why and how' of Hypertension, drug management, theory of Yogic practices applied to Hypertension and the upanishadic message directing towards our real nature of bliss.

(ii) The remaining period of $1\frac{3}{4}$ hrs. was devoted to practices. Very simple easy movements, āsanas, breathing practices, praṇāyāma, dhyāna, Yoga Nidra and devotional session, were introduced to the participants (See Appendix).

The patients learnt the techniques with ease in a group under the guidance of Yoga teachers well trained for the purpose. Emphasis was laid on deep relaxation at each stage of the practice and the participants were made to release their stresses and tensions effectively during the sessions. The practices meant to reduce the metabolic rate, helped them to relax and enjoy the sessions. The technique of revitalisation by breathing, prāṇayāma and mental resolutions in Yoga Nidra was taught to the satisfaction of all the patients.

Details about the patients were obtained before the start of the programme by clinical examinations. Cases with cardiac problems are not included in this presentation. The proforma designed to obtain the data was filled up by the doctor. The parameters recorded were —

Age, Sex, Height, Weight, Duration of Hypertension, Family history of IHD, BP, LM, Symptoms like Headache, giddiness, Cardiac and noncardiac chest pains, Exertional breathlessness, swelling in limbs, constipation or Irritable Bowel Syndrome (IBS), Insomnia, Smoking, drinks etc., Medication (Antihypertensives, tranquilisers, Hypoglycaemic agents, cardiac and other drugs, Caronary dilators etc.), B.P., Oedema and cholestrol.

The details were obtained before and after the programmes for all the patients. For a randomly selected section of patients details of medication were obtained for the previous one month and B.P. was taken 10 days and one day before the programme. This was used as a control data.

After the completion of the programme, the patients were asked to continue their practices either at home or in our centres. They were requested to report about their progress periodically.

5. RESULTS AND DISCUSSION

Based on the subjective narrations of the patients, interrogation and clinical tests by the doctor the data were collected and shown in Table 1. In general, the patients felt agile, fresh, relaxed and energetic after each session and found a cumulative effect as the days progressed. They reported their confidence and a change in outlook in dealing with tense situations at work and home.

The control data (B.P.) taken 10 days and 1 day before showed stabilized readings in patients with good control by regular consumption of drugs and an increasing or erratic trend in other cases. The data on medication during the previous month showed no significant change.

The basic data in Table 1 shows that the 15 days programme has brought some encouraging improvements in almost all parameters.

(i) **Medication :** A glance at Table 1 shows that out of 14 patients who were consuming Anti Hypertensive drugs, 3 have stopped compietely, 2 have reduced their drugs and in 2 of them it increased. The remaining 7 found no change in their drug consumption.

(ii) **B. P.** : Out of 19 patients 13 patients found their B.P. reduced after the 15 days. In 2 cases there was a slight increase in B.P.

In one case the patient could stop his cardiac drugs completely while one did not find any change in his cardiac drug consumption. A statistical analysis using students paired t-test is performed on 2 Parameters – Medication and B.P. (systolic and diastolic seperately). Only antihypertensive drugs were taken into consideration for Medication. The results show that the improvement in medication is significant to a value of $P < 0.01$. There is a significant reduction in the Systolic pressure which is noteworthy while the Diastolic is less significantly changed.

6. SUMMARY AND CONCLUSIONS :

1. The Integrated approach of Yoga Therapy has been used on 19 Hypertensives in the age group 35–78 of whieh 4 were Females.

2. The 2 weeks programme consisted of $2\frac{1}{2}$ hr. evening sessions daily and special longer sessions on Sundays.

3. The integrated approach of Asanas, breathing and Prāṇāyāma, meditation and Yoga Nidra, devotional sessions, lectures and discussions helped to tackle the complex problem of hypertension from different sheaths of our existence – Annamaya, Prāṇamaya, Manomaya, and Vijnānamaya levels.

4. The statistical analysis show a significant reduction in the Systolic B.P.

Some of the follow-up results not presented here are showing a trend of progressive reduction of B.P. and reduced medication. More controlled data and multivariate analysis to throw greater light are in the offing.

REFERENCES

1(a) Benson, H. etal., Decreased systolic blood-pressure in hypertensive subjects who practised meditation. J. Clin. Invest. 1973, Vol. 52, P. 8a.

(b) Benson, H. etal., Decreased blood-pressure in borderline hypertensive subjects who practised meditation. J. Chron. Dis. 1974, Vol. 27, P. 163 - 169.

(c) Benson, H. etal., Decreased blood-pressure in pharmacologically treated hypertensive patients who regularly elicited the relaxation response. Lancet 1974 (Feb.), P. 289 - 291.

(d) Benson, H. etal., & Greenwood, M.M. Behavioral modifications of blood-pressure in man. in Onesti. 6. etal. Regulation of blood pressure by the central nervous system. 119 - 28, 1976, New York, Grune and stratton.

(e) Benson, H. etal., Systemic hypertension and relaxation response. N. Engl. J. Med. 1977, Vol. 296(20) P. 1152 - 56.

2. Blackwell, B. et al., TM in hypertension : Individual response patterns. Lancet. 1976, Vol. 1, P. 223 - 226.

3. Brener, J. & Kleinman R., Learned control of Lecrease in Systolic Blood Pressure. Nature, 1970, 226, P. 1063.

4. Cotton, D.W.K , Yoga and biofeedback in hypertension. (later) Lancet. 1973 (Dec.) P. 1274 - 1275.

5(a) Datey, K.K. Deshmukh, S.N., Dalvi, C.P. (late) and Vinekar, S.L. Shavasana - A Yogic Exercise in the Management of Hypertension. Angiology, 1969, Vol. 20, P. 325 - 333.

6. Funkenstein, D. The Physiology of Fear and Anger. Scientific American. 1955 (May).

7. Kuvalayananda, Swamiand Vinekar. S.L., Yoga Therapy - Its basic principles and Methods. Pub : Govt. of India, 1971.

8. Macleod, J. (Ed.) Davidson's Principles and Practice of medicine. 12th Ed. Pub : English Language Book Society, 1977.

9(a) Nagarathna, R. & Nagendra, H.R., Therapeutic application of Yoga - a Report. Report No. VKYTRC/001/KK. Pub : Vivekananda Kendra Yoga Therapy and Research Centre, Kanyakumari, 1980.

(b) Nagarathna, R. & Nagendra, H.R., The Basis for an Integrated Approach in Yoga Therapy. Report No. VKYTRC / 002 / KK / 1980. Pub : Vivekananda Kendra Yoga Therapy and Research Centre, Vivekanandapuram, Kanyakumari - 629 702, December 1980.

(c) Nagarathna, R. Nagendra, H.R. & Uma, R,, An Integrated approach of Yogic Practices in the Treatment and Rehabilitation of Bronchial Asthmatics. Report No. VKYTRC/004/KK/1981.

10. Northup, T. L., Manipulative Management of Hypertension. 1957. Year Book, Academy of Applied Osteopathy, P, 43.

11. Norris, T. A Study of the Effects of Manipulation on Blood Pressure.

1964 Year Book, Academy of Applied Osteopathy, P. 184.

12(a) Patel, C.H., Yoga and biofeedback in the management of hypertension Lancet 1973 (Nov.) P. 1053 - 1055.

(b) Patel, C.H., Yoga and biofeedback in the management of hypertension (letter). Lancet 1973 (Nov.). Vol. 2, P. 1212.

(c) Patel, C.H., Yoga and Bio-feedback in hypertension (Letter). Lancet 1973 (Dec. 8) P. 1327.

(d) Patel, C.H., Yoga and bio-feedback in hypertension (Letter). Lancet 1973 (Dec. 22) P. 1440 - 1441.

(e) Patel, C.H., 12-month follow-up of Yoga and bio-feedback in the management of hypertension. The Lancet 1975 (Jan.) P. 62 - 64.

(f) Patel, C.H., Randomised controlled trial of Yoga and bio-feedback in management of hypertension. The Lancet 1975 (July) P. 93 - 95,

(g) Patel, C.H., Yoga and bio-feedback in the management of hypertension. J. Psychosom. Res. 1975 Vol. 19, P. 355 - 360.

(h) Patel, C.H., TM and hypertension (Letter) Lancet 1976 (Mar. 6) P. 539.

(i) Patel, C.H., Biofeedback-aided relaxation & meditation in the management of hypertension. Biofeedback Self Regul. 1977, Vol. 2(1), P. 1-41.

13. Shankarananda Saraswati, Swami. Yogic Management of Asthma & Diabetes. Pub : Bihar School of Yoga. 1977.

14. Shapiro, D. etal., Effects of Feedback and Reinforcement on the control of Human Systolic Blood Pressure, Science, 1969, 163, P. P. 588 - 90.

15. Simon, D.B. etal. The TM. Programme and essential hypertension. Sc. Res. TM. Coll. Pap. 1976, Vol. 1, P. 268 - 69.

16. Wallaes, R.K. & Benson, H. Physiology of Meditation. Scientific American, Vol. 226. No. 2, 1972 (Feb,) PP. 84 - 90.

TABLE : 1 BASIC DATA ON HYPERTENSION

Sl. No.	YTNRHT Reg. No.	Sex	Age	Duration in Years	Family History			SYMPTOMS								Anti Hypertensives tab/week	Weight Kg.	B.P.				
					I.H.D.	B.P.	D.M.	Headache	Giddiness	Chestpain (Cardiac) (Attacks/day)	Chestpain (Non-Cardiac)	Exertional breathlessness	Constipation	Insomnia	Smoking			Before	After	Oedema	Cholestral mg.	Other Cardiac drugs
1	01	F	53	1½	—	—	—	+	+	2	—	1	—	+	—	7/7	42	110/80	120/80	—	—	14/0
2	02	M	47	6½	—	—	—	—	—	—	—	—	—	—	—	7/7	75	150/100	130/90	—	220	—
3	03	M	62	5	—	—	—	—	—	2	—	1	—	+	—	14/21	57	210/130	200/120	—	225	—
4	04	M	34	7	—	+	—	+	—	—	—	—	+	+	+	7/7	61	160/120	160/120	—	136	—
5	05	M	39	3	—	—	—	—	+	—	—	—	—	—	—	14/14	64	180/100	180/100	—	—	—
6	06	M	50	5	+	+	—	—	—	—	—	1	—	—	—	28/21	66½	160/120	140/100	—	—	—
7	07	M	78	1	—	—	—	—	—	—	—	—	—	—	—	—	60	160/100	150/100	+/-	—	14/14
8	08	M	45	12	—	—	—	—	—	—	+	1	—	—	—	7/14	68	160/110	160/100	—	—	—
9	09	M	63	20	—	—	—	+	—	—	—	—	—	—	—	14/14	52	180/100	190/110	—	210	—
10	10	F	43	4	—	—	—	+	—	—	—	—	—	—	—	1/0	58½	160/100	140/90	—	—	—
11	11	M	48	7	—	+	—	—	—	—	—	—	—	+	—	0/0	—	160/100	130/90	—	144	—
12	12	M	41	7	+	+	—	+	—	—	1	—	IBS	—	—	7/0	70	130/94	130/90	—	188	—
13	13	M	47	4	—	—	—	—	—	—	—	—	—	—	—	14/7	64	178/100	150/100	—	—	—
14	14	F	44	5	—	—	—	+	+	3	—	—	—	—	—	56/56	70	140/90	150/100	+/-	194	—
15	15	F	35	¾	—	—	—	—	—	—	—	—	—	+	—	0/0	76½	180/110	170/100	—	—	—
16	16	M	40	1½	—	+	—	—	—	+	—	—	—	—	—	0/0	75	140/100	130/95	—	—	—
17	17	M	68	20	—	—	—	—	—	—	—	—	+	—	—	7/0	68	160/105	140/90	—	39	—
18	18	M	39	5	—	—	—	—	—	—	—	—	+	—	—	14/14	72½	130/80	125/80	—	—	—
19	19	M	44	1	—	+	—	—	—	—	—	—	—	—	—	0/0	76½	180/110	170/110	—	—	—

TABLE 2 : STATISTICAL ANALYSIS — HYPERTENSIVES

S. No.	Details	No. of Patients	Initial	Final	P.
1	Medication (Antihypertensives)	19	11.47±12.77	9.31±12.93	<0.01
2	Systolic B.P.	17	155.1±26.15	138.6±56.50	<0.008
	Diastolic		101.47±13.2	99.06±14.83	<0.02

APPENDIX

LIST OF YOGIC PRACTICES FOR HYPERTENSION AND IHD

I. Breathing Practices :

(1) Hands In and Out Breathing (10x3)
(2) Hand Stretch Breathing (10)
(3) Ankle Stretch Breathing (10)
(4) Tiger Breathing (10)

Relax in Śavāsana.

II. Asanas

(A) **Prone Postures**

(1) Bhujangāsana
Relax in Makarāsana
(2) a) Ardha Śalabhāsana ($\frac{1}{2}$ mt. each leg)
b) Salabhasana ($\frac{1}{2}$ mt.)
Relax in Makarasana
Repeat with slowness and relaxation 2 times.
Śavāsana.

(B) **Sitting Postures :**

(1) Vakrāsana or Ardha Matsyendrāsana
(2) Sasankasana
(3) Suptavajrāsana
(4) Padmasana or Vajrasana

Śavāsana.

(C) **Standing Postures :**

(1) Ardha Kati Cakrāsana
(2) Trikonāsana
(3) Parswa Konasana
(4) Pada Hastasana
(5) Ardha Cakrāsana

With caution-

Śavāsana.

III, (A) Sectional Breathing

.....Abdominal [9]
.....Thoracic [9]
.....Upper Lobar [9]

(B) Prānāyāma

(1) Nādi Suddhi [5]
(2) Śītkari [5]
(3) Bhramari [5]

(C) OMKAR Chanting

..... A [3]
..... U [3]
..... M [3]

(D) Meditation and Silence.

IV. Yoga Nidra.

Report No. VKYTRC / 007 / KK / 1981

Yoga Therapy for Ischaemic Heart Diseases - Feasibility Studies

by

R. NAGARATHNA* & Dr. H. R. NAGENDRA**

ABSTRACT: Fifteen cases of Ischaemic Heart Diseases with or without episodes of Myocardial Infarctions have been treated by the integrated approach of Yogic practices in a 2 Weeks programme. Under the care of a cardiac specialist, the programme was run every evening for $2\frac{1}{2}$ hrs. Introduced in the course were the theoretical aspects related to the modern medical knowledge about the cardiac diseases; Yoga and its application to IHD. The practice of the integrated approach of Yoga Therapy helped the patients to gain great confidence about their inherent ability to deal with their ailment.

The statistical analysis of the data also strengthen the subjective feelings of the patients indicating a significant reduction in their B.P. medication, and chest pain.

These encouraging results clearly show that the application of the integrated approach of Yoga Therapy in the rehabilitation of Cardiac patients is bright.

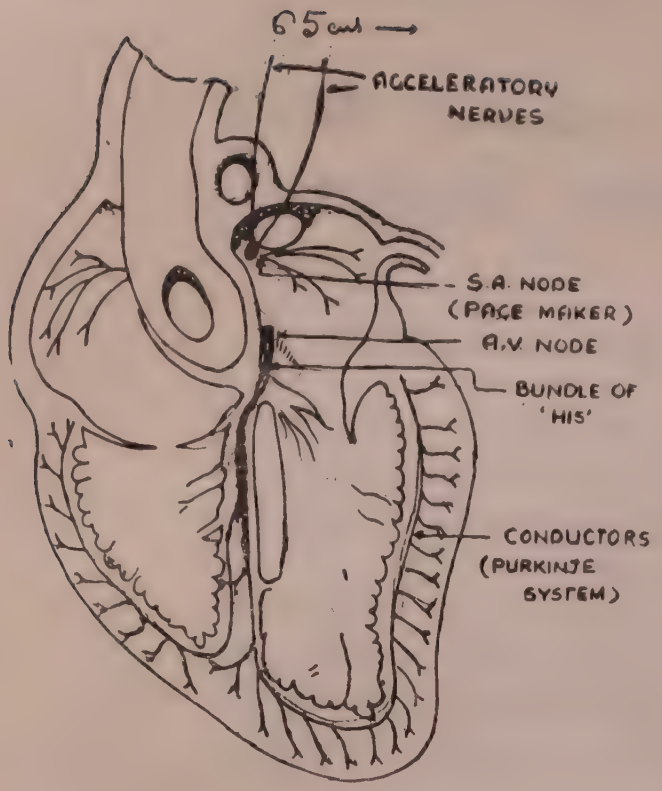
1. INTRODUCTION

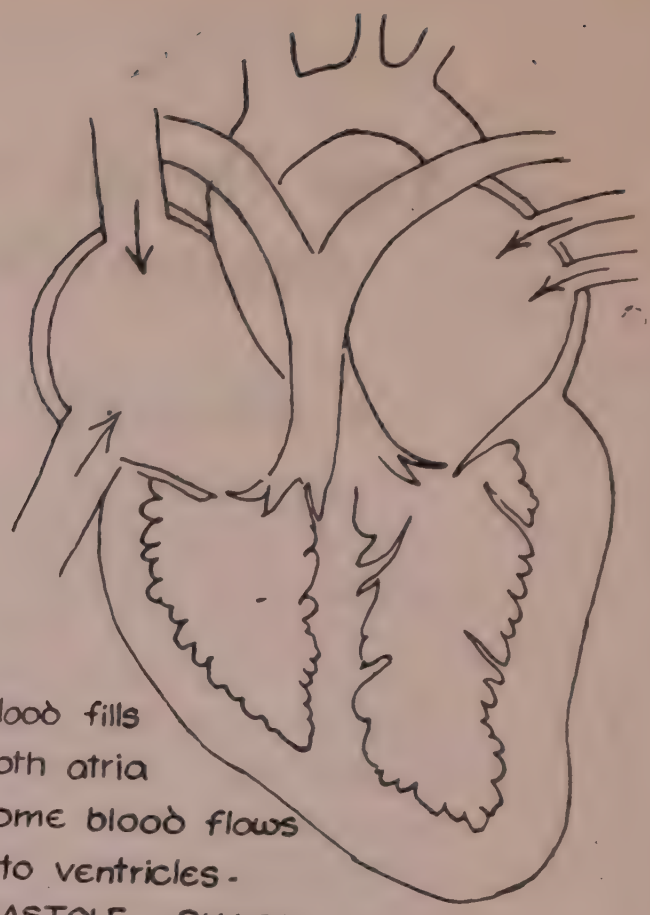
At all ages and in all countries, diseases of the cardiovascular system are major causes of death and disability. In communities where infection is a lesser problem than formerly, congenital heart disease now accounts for a higher proportion of deaths in infancy and is beginning to overtake rheumatic fever as a cause of heart disease in the child-bearing years. In most countries with a high standard of living, coronary and cerebral arterial disease and hypertension are responsible for more than 50 per cent of the deaths and of these at least half are due to ischaemic heart disease. Over the last century, not only have coronary attacks become more common,

* Chief Consultant,
Vivekananda Kendra

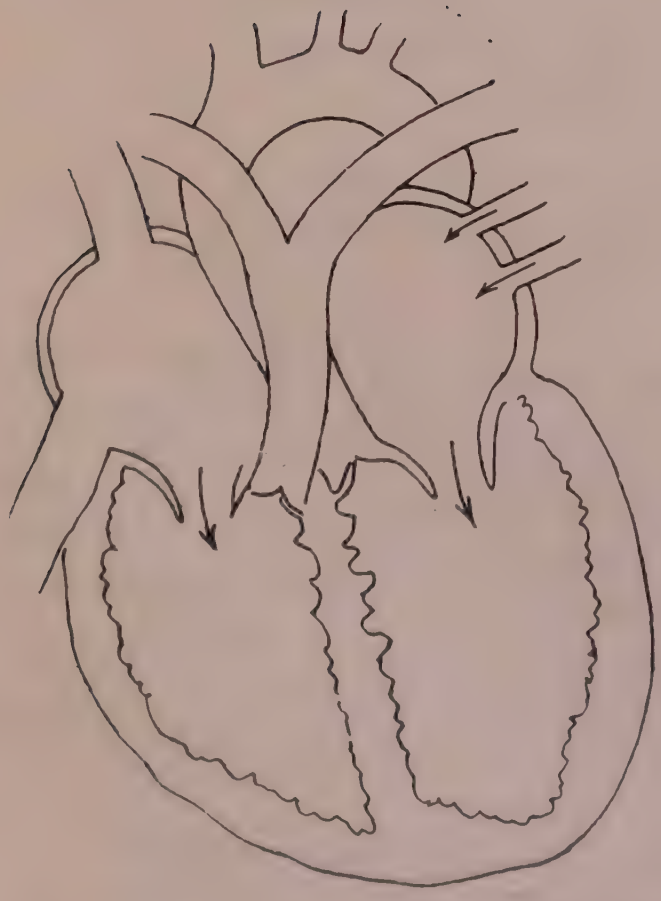
** Secretary, Yoga Shiksha Vibhag
Vivekananda Kendra

Published by: Vivekananda Kendra Yoga Therapy & Research Centre
Vivekanandapuram, Kanyakumari-629 702.

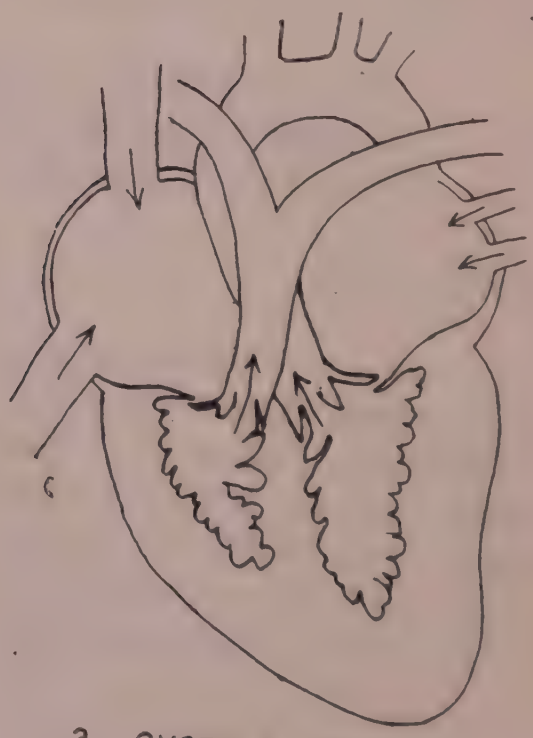




1. blood fills both atria
Some blood flows into ventricles -
DIASTOLE PHASE



2. ATRIA CONTRACT
squeezing blood into ventricles



3 SYSTOLE PHASE
ventricles contract squeezing blood into aorta and pulmonary arteries

but now it is not unusual for men in their thirties to be admitted to a coronary care unit, particularly heavy cigarette smokers in whom arterial disease of the legs is also common. For those who breathe air polluted by smoke, pulmonary damage may lead to cardiac failure especially in men from the mid-forties onwards.[4]*

Atheromatous disease of the coronary arteries is the most important single cause of death in the Western world. It is the commonest cause of angina pectoris and leads also to myocardial infarction and its complications, to cardiac failure and to sudden death. This is called coronary Heart Disease or Ischaemic Heart Disease (IHD).

Angina pectoris is the name for a clinical syndrome rather than a disease. In this the pain lasts for 1 to 3 minutes and disappears. Prolonged pain may cause cardiac arrest or Heart attack. Thus angina is a transient phase and Myocardial Infarction leaves a permanent scar on the cardiac muscle.

These cardiac problems, the diseases of the affluent and that of the modern era can hardly be tackled by drugs. They are posing a great challenge to the medical world.

Zamarra[7] reports the effect of T.M. in the prevention and rehabilitation of patients with angina pectoris. Based on others[1,4] and our early experience[5] with a few IHD patients through deep relaxation techniques, and the adoption of the Integrated approach of Yoga Therapy we conducted a programme for patients with cardiac problems. This report presents the results of such a feasibility study.

* Superscripts denote references at the end.

Let us look at our circulatory system, specially the heart to understand the cardiac problems a little better.

2.1 A Look at our Heart:

Figure 1 shows a schematic of the heart and the pumping cycle of blood. The heart is a double pumb from which blood circulates in the body. It is a pear shaped hollow organ whose walls are made of strong cardiac involuntary muscles. Placed between the 2 lungs, the cavity of of the heart is divided by the septum into left and right portions. Each of these portions are partitioned to 2 parts by 'one way' valves, Tricuspid on the right and bicuspid on the left. The upper chambers are the atria or auricles and the lower ones, the ventricles. The Sinus Node situated in the right atrium is the 'Pace Maker' for the heart. It sends regular impulses to make the muscle tissue contract. The A-V Node at the junction of the atria and the ventricles slows the impulse down. Through a special system of conduits the impulse travels down to affect the contraction of the ventricle.

The schematic in Figure 1 shows the successive steps in pumping the blood, the right ventricle to the lungs and the left to the Aorta. Hence, the left ventricle muscles are thicker than those of the right.

2.2 Cardio Vascular ailments:

The term heart disease actually applies to various illnesses that affect the circulatory system. More exact name would be cardiovascular diseases.

(a) Atherosclerosis:

Atherosclerosis is a form of arteriosclerosis, or hardening of the arteries. Most

heart attacks can be traced to atherosclerosis of the coronary arteries, through which travels the blood that nourishes the heart muscle. Most strokes result from atherosclerosis in the arteries that deliver blood to the brain. This disease may begin at an early age and go undetected untill the middle years or later. Most people have it to some degree without troublesome symptoms and live a normal life span. In atherosclerosis, the inner walls of the arteries are gradually thickened and roughened by deposits of fatty material. As more layers of deposits are formed, they narrow the channel through the artery, hindering the flow of blood. When the artery wall is considerably roughened, blood clots may form on the roughened areas and block the circulation at that point.

(b) **Heart Attacks :**

Usually what is meant by a heart attack is what doctors call coronary thrombosis or myocardial infarction. It is a sudden blocking of one of the arteries that supply blood to the heart muscle. A clogged artery may be closed by a blood clot (thrombus), and the part of the heart muscle fed by that artery may deteriorate or die from lack of blood. In such cases, healing begins almost immediately, and scar tissues begin to form in the damaged area of the heart. Treatment and rest give the heart time to heal itself. For some patients, doctors prescribe drugs to prevent new clots from forming.

(c) **Angina Pectoris :**

Angina pectoris is an uncomfortable sensation of pressure, tightness, or pain usually in the front part of the chest. It is a sign that the heart muscle is not getting enough oxygen through its blood supply. An attack is ordinarily brought on by over-exercise, excitement or overeating. Usually, rest or nitroglycerine tablets will relieve the pain in a few minutes. Angina pains may occur both in a person who has recovered from a heart attack, or in one who has never had a heart attack and may never have one. Nevertheless, severe chest discomfort should always be reported to a doctor because it could be the forerunner of a heart attack. Chest discomfort, of course, can also have many other causes.

(d) **Congenital Heart Defects :**

The kind of heart defect is present at birth, although it may not be discovered untill later. In it, the heart or a major blood vessel near the heart fails to mature normally during the period of growth before birth. About 30,000 to 40,000 children are born with heart defects in the United States each year. Mild inborn defects may never cause trouble; but serious ones may interfere with circulation of the blood, slow the child's growth, and reduce its energy. Because of great progress in heart surgery, most patients with congenital heart defects can be restored to normal or near–normal health.

(e) **Congestive Heart Failure :**

To say that a person has heart failure does not mean that his heart has stopped beating. In congestive heart failure, the heart muscle goes on working, but with lesser strength than is needed for good health. This condition may follow a severe heart attack or rheumatic fever, or it may occur in connection with a congenital heart defect or with very high blood pressure. It often results, especially in elderly people, from muscle damage due to atherosclerosis

of the coronary arteries. The usual symptoms are swelling of legs and ankles (edema) and extreme shortness of breath. Treatment includes drugs to strengthen the action of the heart; rest to ease its work load; and diet or drugs, especially digitalis and diuretics, to control edema. Patients who follow their doctor's instructions faithfully find that their heart failure can be controlled. Usually they can carry on their normal activities while guarding their hearts against extra strain.

2.3 **Aetiology :** Causes of Ischaemic Heart Disease.

The causes for narrowing of coronary arteries which supply blood to the heart are :—

(i) Deposition of cholesterol in the inner surface of the arteries due to excessive fat diet–obesity

(ii) Heridity

(iii) Cigarette smoking

(iv) Psychological stresses and Hypertension

2.4 **Treatment :**

(i) *General advice :*

Patients usually require a careful explanation of the problem, which can be presented as a mismatch between coronary supply and cardiac needs. The natural process of repair by development of anastamoses should be stressed. Patients can then learn how to help themselves, e.g. by avoiding walking after meals, particularly in the cold or against a wind, and severe unaccustomed exertion. They may need encouragement and support in their endeavours to stop smoking cigarettes or to lose weight. In a few patients hyperlipoproteinaemia requires treatment by diet and other measures.

(ii) *Drugs :*

(a) Fresh glyceryl trinitrate (GTN 0.5 mg), allowed to dissolve under the tongue or crushed for more rapid effect and retained in the mouth, usually relieves the pain in 2 to 3 minutes. The best use of GTN is prophylactically before exercise recognised as liable to produce anginal pain. The good effect comes from the lowering of blood pressure and dilation of coronary vessels. Not more than about two per hour should be used. If the requirement for it increases significantly the patient should seek medical advice.

(b) Antiplatelet agents : Drugs which reduce the adhesiveness of the platelets so that further clot formation inside the blood vessels can be prevented. Aspirin is one such drug.

(c) Cholesterol lowering agents :— Certain drugs are useful in lowering the blood cholesterol level. In these patients with raised levels, if the blood cholesterol does not settle down with strict avoidence of solid fats in their diet and minimal usage of cholesterol lowering oils like sun flower oil, these drugs are used.

(d) Drugs to keep the blood presure or diabetes, under good control if they have hypertension or diabetes.

3. YOGA THERAPY :

The Yogic management of these cardiovascular ailments consists of (i) Preventing the disease to grow and (ii) Rehabilitating the patients after the ischaemic has occured.

Regular practice of Yoga Asanas, Prāṇāyama, meditation, devotional session

etc would help in prevention as well as in rehabilitation.

Working at different levels – physical, Prāṇic, mental, emotional, intellectual – the patients will learn to work with much lesser catabolic processes. The principles of Yoga Therapy [5] include :

(i) Relaxation

(ii) Development of forbearance power and

(iii) Deep internal awareness.

Asanas, breathing, Prāṇāyāma, meditation, devotional session, Yoga Nidra, and analysis are used to teach the basic facets of Yoga therapy to the participants.

4. PATIENTS AND METHODS :

Fifteen patients (all Males) in the age group of 32 to 67 with established IHD history varying from 3 months to 10 years under rehabilitation treatment were investigated using the integrated approach in Yoga Therapy. There were 20 cases who had survived 3 Myocardial infarctions. The programme of introducing the Yoga practices lasted 15 days. The patients underwent a session of $2\frac{1}{2}$ hrs. daily in the evening. On sundays they all joined for a longer session. The regular evening sessions covered the following aspects :

(i) A lecture session lasting about 45 minutes in which the following topics were covered : Circulatory system, Heart, Diseases of the heart, Aetiology of IHD, Treatment and rehabilitation, theory of Yoga therapy as applied to IHD and Vichāra to remove the basic fear normally inherent in these patients which aggravates the problem.

(ii) The remaining period of $1\frac{3}{4}$ hrs. was devoted to practices. Very simple easy movements, asanas, breathing practices, prāṇāyāma, dhyāna, Yoga Nidra and emotional control through devotional session, were introduced to the participants (See Appendix).

Under the continuous supervision of the cardiac specialist, the patients learnt the techniques with ease in a group under the guidance of Yoga teachers well trained for the purpose. Emphasis was laid on deep relaxation at each stage of the practice and the participants were made to release their stresses and tensions effectively during the sessions. The practices helped them to relax and enjoy the sessions. The technique of revitalisation by breathing, prāṇāyāma and mental resolutions in Yoga Nidra was taught to the satisfaction of all the patients.

All the details about these patients were taken including ECG. The details were collected before and after the programme for all the patients. For a randomly selected section of patients details of medication were obtained for the previous one month and B.P. was taken 10 days and oneday before the programme. This was used as control data.

After the completion of the programme, the patients were asked to continue their practices either at home or in our centres. They were requested to report about their progress periodically.

5. RESULTS AND DISCUSSIONS :

Table 1 shows the basic data collected before and after the programmes. In general, the patients could overcome their fear that 'I am a heart patient'. They gained the necessary knowledge to deal with the situation with confidence and

discrimination. After each session, they felt better, more at ease, relaxed and fresh. These feelings percolated in their daily work too, as per then our reports.

The control data (B.P., medication) taken 10 days and 1 day before showed no significant change and formed the base line. Looking at Table 1, the following observations can be made.

(i) Out of 9 patients using antihypertensive drugs, 4 of them completely stopped and the rest reduced their dosage.

(ii) Out of 4 patients consuming coronary drugs, 3 could completely stop; one continued the same dosage.

(iii) There was a decrease in B.P. in 7 out of the 12 cases; in 2 a slight increase was observed.

The statistical analysis using Student's paired t-test indicate a significant improvement in the 3 parameters analysed - Medication (antihypertensives), B.P. (both systolic and diastolic) and chest pain.

6. CONCLUSIONS :

The significant improvements in B.P. medication, chest pain and the general subjective feeling of well being and self confidence developed due to the Yoga base - in theory as well as practice clearly show a bright propects of utilising the integrated approach of Yoga therapy in the prevention and rehabilitation of patients suffering from cardiac ailments.

REFERENCES

1. Bauer, W.W. Todays Health Guide. Pub : American Medical Association (1970)

2. Brena, S.F., Yoga and Medicine, Pub : The Julian Press Inc. NY, 1975 P. 153

3. Kuvalayananda, Swami and Vinekar, S.L. Yogic Therapy - Its basic Principles and Methods; Pub : Govt. of India, 1971.

4. Macleod, J. (Ed.) Davidson's Principles and Practice of medicine. 12th Ed. Pub : English Language Book Society, 1977.

5. Nagarathna, R. and Nagendra, H.R., Therapeutic application of Yoga-a Report; Report No. VKYTRC / 001 / KK, Pub : Vivekananda Kendra Yoga Therapy and Research Centre, Kanyakumari, 1980.

6. Sivananda Saraswati, Swami. Yogic Therapy; Pub : Umachal Yogashram, Gauhati, 1965. p-201.

7. Zamarra, J.W. etal; The effects of the TM program on the exercise performance of patients with angina pectoris. Sc. Res. T.M. Coll. Pap. 1976, Vol. 1, p. 270-78.

TABLE : 1 BASIC DATA OF IHD PATIENTS

Sl. No.	YTNRIHD Reg. No.	Sex	Age	Duration in Years	Family History			SYMPTOMS								Anti Hypertensives tab/week	Weight Kg.	B.P.					
					I.H.D.	B.P.	D.M.	Headache	Giddiness	Chestpain (Cardiac) (Attacks/day)	Chestpain (Non-Cardiac)	Exertional breathlessness	Constipation	Insomnia	Smoking			Before	After	Oedema	Cholestral mg.	Coronary druge Tabs/Week	Other Cardiac drugs
1	01	M	58	8	+	+	+	—	—	2/0	—	2/1	+/-	+/-	—	21/0	$83\frac{1}{2}$	130/74	105/70	+/-	N	3/0	—
2	02	M	56	10	+	—	—	—	—	2/1	—	—	+/-	—	—	0/0	55	105/80	110/80	—	100	0/0	—
3	03	M	40	1	—	—	—	—	—	—	—	—	—	+/-	+/-	0/0	$54\frac{1}{2}$	125/90	130/80	—	307	0/0	—
4	04	M	49	4	—	—	—	+/-	+/-	2/0	—	2/0	—	—	—	$1\frac{3}{4}$/0	$59\frac{1}{2}$	110/100	90/70	+/-	173	—	3/0
5	05	M	57	1	—	—	—	+/-	—	—	+/-	1/0	—	—	—	$1\frac{3}{4}$/0	50	110/80	90/60	—	225	—	—
6	06	M	54	4	—	—	—	—	—	—	—	1/0	—	—	—	0/0	70	130/100	130/90	—	—	0/0	0/0
7	07	M	47	5	—	+	—	—	—	—	—	1/0	—	—	—	$8\frac{3}{4}$/7	65	130/90	100/75	—	175	—	—
8	08	M	48	$\frac{3}{4}$	—	—	—	+/-	+/-	—	+/-	1/0	+/-	+/-	—	14/7	75	110/80	130/94	—	—	—	—
9	09	M	67	7	—	—	—	—	—	2/0	—	—	+/-	—	—	—	64	110/70	110/70	—	N	14/0	1/0
10	10	M	50	3	—	—	—	—	—	—	—	2/0	—	—	—	14/7	49	110/72	110/70	—	—	—	—
11	11	M	67	$\frac{1}{2}$	—	—	—	—	—	—	+/-	—	—	—	—	7/7	70	130/90	140/100	—	194	—	14/14
12	12	M	56	8	+	+	+	—	—	1/1	—	—	—	—	—	$24\frac{1}{2}/10\frac{1}{2}$	72	150/100	150/100	—	—	14/14	—
13	13	M	36	4	+	—	—	—	—	1/0	—	—	—	—	—	0/0	63	117/85	110/80	—	156	—	—
14	14	M	53	4	—	—	—	—	—	2/1	—	2/1	—	—	—	14/0	63	150/90	130/80	—	130	7/0	—
15	15	M	34	$\frac{1}{4}$	—	—	—	—	—	1/0	+/-	—	—	—	—	0/0	45	110/70	90/60	+/-	—	0/0	—

TABLE 2 : STATISTICAL ANALYSIS — IHD PATIENTS

S. No.	Details	No. of Patients	Initial	Final	t	p.
1	Medication (Antihypertensives)	13	6.6±8.9	1.88±3.67	2.94	0.008
2	B.P. Systolic	10	126±18.2	116±22.05	2.96	0.008
	B.P. Diastolic		85.6±11.96	76±23.51	3.30	/0.005
3	Chest pain (Cardiac)	8	13	3		

APPENDIX

LIST OF YOGIC PRACTICES FOR HYPERTENSION AND IHD

I. Breathing Practices :

(1) Hands In and Out Breathing (10x3)
(2) Hand Stretch Breathing (10)
(3) Ankle Stretch Breathing (10)
(4) Tiger Breathing (10)

Relax in Śavāsana.

II. Asanas

(A) **Prone Postures**

(1) Bhujangāsana
Relax in Makarāsana
(2) a) Ardha Śalabhāsana ($\frac{1}{2}$ mt. each leg)
b) Salabhasana ($\frac{1}{2}$ mt.)
Relax in Makarāsana
Repeat with slowness and relaxation 2 times.
Śavāsana.

(B) **Sitting Postures :**

(1) Vakrāsana or Ardha Matsyendrāsana
(2) Sasānkasana
(3) Suptavajrāsana
(4) Padmāsana or Vajrāsana

Śavāsana.

(C) **Standing Postures :**

(1) Ardha Kati Cakrāsana
(2) Trikonāsana
(3) Parswa Konāsana
(4) Pada Hastāsana | With caution
(5) Ardha Cakrāsana | caution

Śavāsana.

III. (A) Sectional Breathing

.....Abdominal [9]
.....Thoracic [9]
.....Upper Lobar [9]

(B) Prānāyāma

(1) Nādi Suddhi [5]
(2) Śītkari [5]
(3) Bhramari [5]

(C) OMKAR Chanting

..... A [3]
..... U [3]
..... M [3]

(D) Meditation and Silence.

IV. Yoga Nidra.

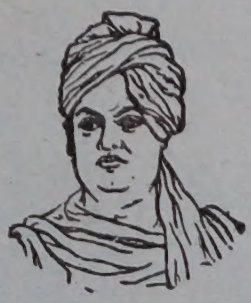
DR438 01531

COMMUNITY HEALTH CELL
47/1, (First Floor) St. Marks Road
BANGALORE - 560 001

ACKNOWLEDGEMENTS

The authors are indebted to many workers of Vivekananda Kendra with whose help the work has been made possible. Thanks are due to Sri Raghuram for the Statistical analysis of the data.

PRICE Rs. 10/-



VIVEKANANDA KENDRA YOCTAS

(H. Q. KANYAKUMARI)

37, 4th MAIN ROAD, MALLESWARAM, BANGALORE - 560 003

Phone : 36 87 88 and 60 75 85

OFFERS

Outpatient clinic facilities for the following ailments

- **Asthma, Allergic rhinitis, Chronic Bronchitis, etc.**
- **Diabetes, Thyrotoxicosis**
- **High B.P., Low B.P., Ischaemic Heart Disease**
- **Epilepsy, Migraine, Tension Headache, Anxiety Neurosis, Mental Retardation**
- **Rheumatism, Obesity, Low back pain**
- **Peptic Ulcer, Chronic Diarrhoea, Dysentery**

CONSULTATION:

Tuesdays : 5 to 7 p.m. **Dr. Uma Krishnamurthy**
Consulting Psychiatrist

Thursdays : 5 to 7 p.m. **Dr. R. Nagarathna**
Yoga Therapy Specialist

Easy simple selected yogic practices which include Asanas, Pranayama, Kriyas, Meditation, etc., will be taught by trained teachers after detailed medical consultation.

BECOME SUBSCRIBERS

FOR

YOGA SUDHA

CONTENTS

* *WISDOM FROM UPANISHADS*
* *YOGA VASISTHA*
* *TECHNIQUES OF YOGA*
* *YOGA DAIRY*
* *READERS FORUM*
* *ETC. ETC.*

Subscription :- Rs. 7/- per annum (Inland)

★

Special Feature :- Get a Copy of YOGA SUDHA everymonth, by sending Rs. 100/- which will be refunded in full when you wish to discontinue the monthly.

All our well-wishers who are receiving *Yoga Sudha*, but have not yet sent their subscriptions, are requested to subscribe at the earliest and also make more friends to do so and read *Yoga Sudha*.

Sri Nithyananda Printers, 46, 4th Cross, Ashokanagar, Bangalore-560 050